

IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS

Claims 1-12. (Canceled)

13. (Previously Presented) A process for forming a semiconductor substrate, comprising:

providing a monocrystalline silicon-containing material having a porosity of not more than 30%, H-terminated and having a surface substantially free of oxidation; and

forming an organic layer having more than half of its atoms being carbon and hydrogen in the presence of an alcohol-ferrocene solution, wherein the organic layer is chemically bonded to the surface of the silicon-containing material, wherein an electrical property selected from surface recombination velocity, carrier lifetime, electronic efficiency, voltage, device capacitance, contact resistance, and resistance of a doped region of the semiconductor substrate is changed at compared to the electrical property of the substrate in the absence of the organic layer, thereby forming a semiconductor substrate, and

wherein as a result of said organic layer being chemically bonded to the surface of the silicon-containing material, said surface comprises a measurable carrier lifetime for low-level injection of more than approximately 7.8 μ s or for high-level injection of more than approximately 12 μ s, or a measurable surface

recombination velocity of less than approximately 1300 cm/s for low-level injection or 810 cm/s for high-level injection.

Claims 14-15. (Canceled)

16. (Original) The process of claim 13, wherein the organic layer comprises a monolayer.

17. (Original) The process of claim 13, wherein the organic layer comprises a polymer.

Claims 18-20. (Canceled)

21. (Original) The process of claim 13, wherein forming the organic layer comprises:

activating the surface of the silicon-containing material to form an activated surface;

reacting the activated surface with a chemical, wherein during the reaction, a hydrocarbon group becomes chemically bonded to the silicon-containing material.

22. (Original) The process of claim 21, wherein activating comprises halogenating the surface of the silicon-containing material to form the activated surface.

23. (Original) The process of claim 22, wherein the hydrocarbon group has no more than nine carbon atoms.

24. (Original) The process of claim 23, wherein the hydrocarbon group is an alkyl group.

25. (Original) The process of claim 21, wherein the hydrocarbon group is an allyl group.

26. (Previously Presented) The process of claim 25, further comprising forming a polymer layer from the allyl group.

27. (Original) The process of claim 21, wherein the hydrocarbon group is an alkoxide group.

Claims 28-48. (Canceled)

49. (Previously Presented) The process of claim 13, wherein as a result of said organic layer being chemically bonded to the surface of the silicon-containing material, said surface comprises a methylated surface with measurable carrier lifetimes for low-level injection of at least approximately 260 μ s or for high-level injection of at least approximately 290 μ s, or with measurable surface recombination velocities of not more than approximately 17 cm/s for low-level injection or 21 cm/s for high-level injection, or combinations thereof.

50. (Previously Presented) The process of claim 13, wherein as a result of said organic layer being chemically bonded to the surface of the silicon-containing material, said surface comprises an ethylated surface with measurable carrier lifetimes of more than approximately 40 μ s or with measurable surface recombination velocities of less than approximately 350 cm/s, or both.

51. (Previously Presented) The process of claim 13, wherein as a result of said organic layer being chemically bonded to the surface of the silicon-containing material, said surface comprises an ethylated surface with measurable carrier lifetimes of more than approximately 30 μ s, or with measurable surface recombination velocities of less than approximately 470 cm/s, or both.

52. (Previously Presented) The process of claim 13, wherein as a result of said organic layer being chemically bonded to the surface of the silicon-containing material, said surface comprises a hexylated, octylated or dodecylated surface with measurable carrier lifetimes of at least approximately 20 μ s, or with measurable surface recombination velocities of not more than approximately 200 cm/s, or both.

53. (Previously Presented) The process of claim 13, wherein as a result of said organic layer being chemically bonded to the surface of the silicon-containing material, said surface comprises an alkoxylated surface with measurable carrier lifetimes of more than approximately 150 μ s for low-level infection or more than approximately 140 μ s for high-level injection, or with measurable surface

recombination velocities of not more than approximately 70 cm/s, or combinations thereof.

54. (Canceled)